

1. A method of monitoring a sample containing a neutron source in which:

i) signals from a plurality of neutron detectors are analysed and the count rates for single, double and triple incidence of neutrons on the detectors are determined;

ii) the single, double and triple count rates are equated to a mathematical function related to the spontaneous fission rate, self-induced fission rate, detection efficiency and  $\alpha, n$  reaction rate;

C1 iii) a probability distribution is assigned to each of the self-induced fission rate, detection efficiency and  $\alpha, n$  reaction rate and each of the counting rates to provide a probability distribution factor for any given value, wherein the probability distribution assigned to,

the single, double, and triple count rates is a normal distribution,

the self-induced fission rate is a flat distribution,

the detector efficiency is a triangular distribution, and

the  $\alpha, n$  reaction rate is a triangular distribution;

iv) and the value of the product of all the probability distribution factors is increased to give an optimised solution and so provide a value for the spontaneous fission rate which is linked to the mass of the neutron source.

C2 10. A method according to claim 1 in which the distribution(s) are constrained within certain applied constraints/boundaries, such that the probability distribution factor is zero beyond the constraints or such that the probability distribution factor rapidly tends to zero beyond certain values.

11. A method according to claim 1 in which one or more of the constraints are set according to information gathered from a preceding isotopic consideration or analysis of the sample.

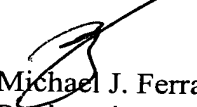
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12. A method according to claim 1 in which the increasing, and preferably maximisation, of the product of the probability distribution factors (pdf's) is preferably performed as an iterative process.

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If any additional fees (beyond the \$110.00 for Request for one month Extension of Time to Respond) are due in connection with the filing this Response to Restriction Requirement, the Commissioner is hereby authorized to charge such fees to Deposit Account 500388 (Order No. 50-0388).

Respectfully submitted,  
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